GEOTHERMAL PROJECT DEVELOPMENT HURDLES

August 1, 2007

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A Quick Overview of PacifiCorp

- We supply and distribute electric energy in six western states: California, Idaho, Oregon, Utah, Washington, and Wyoming
- Three business units:
  - **PacifiCorp Energy**: Generation, Mining, and Commercial & Trading
  - **Rocky Mountain Power:** Provides transmission & distribution services in Idaho, Utah, and Wyoming
  - **Pacific Power**: Provides transmission & distribution services in California, Idaho, and Oregon
- 1.67 million customers
- Over 9,500 MW of generating resources (net capability)
  - Thermal ~8,000 MW (coal and gas)
  - Hydro ~1,200 MW
  - Renewables ~300+MW (wind and geothermal)
  - Contracts (includes wind, coal, and gas)
- Over 6,500 employees

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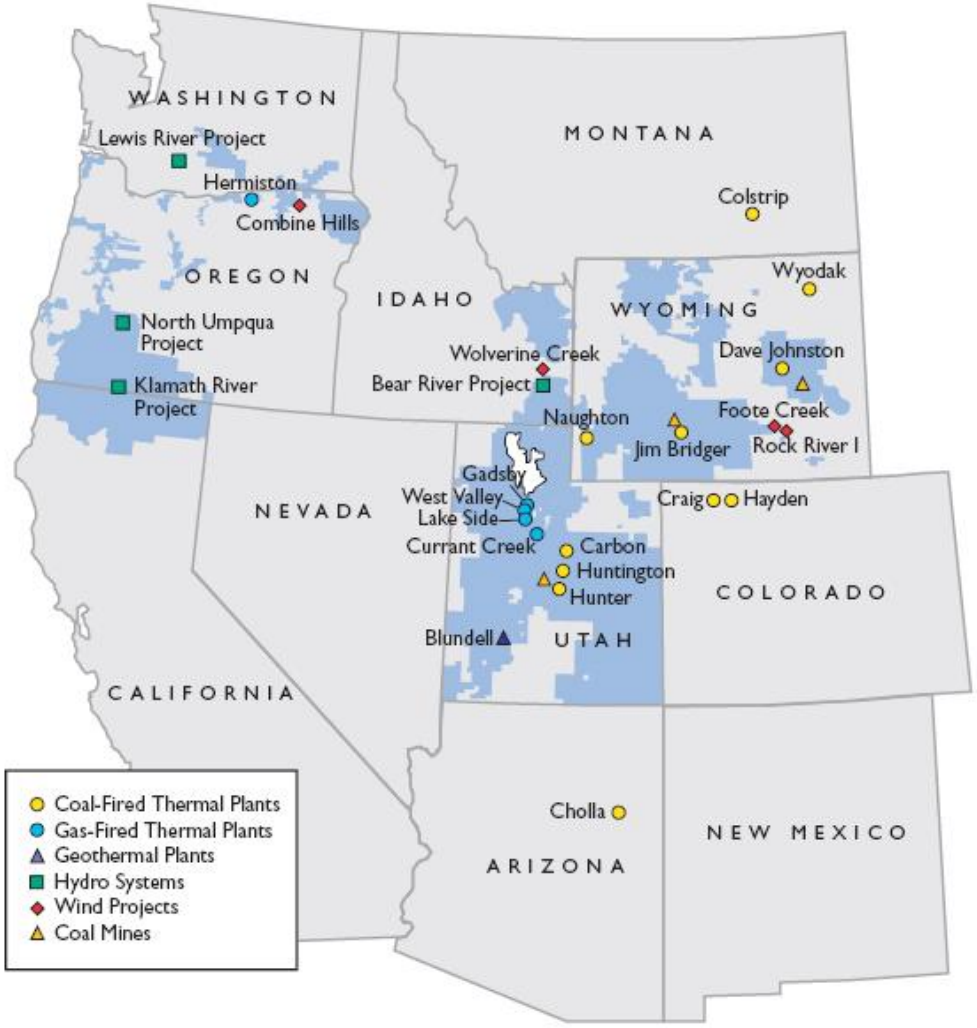
PacifiCorp's Service Territory



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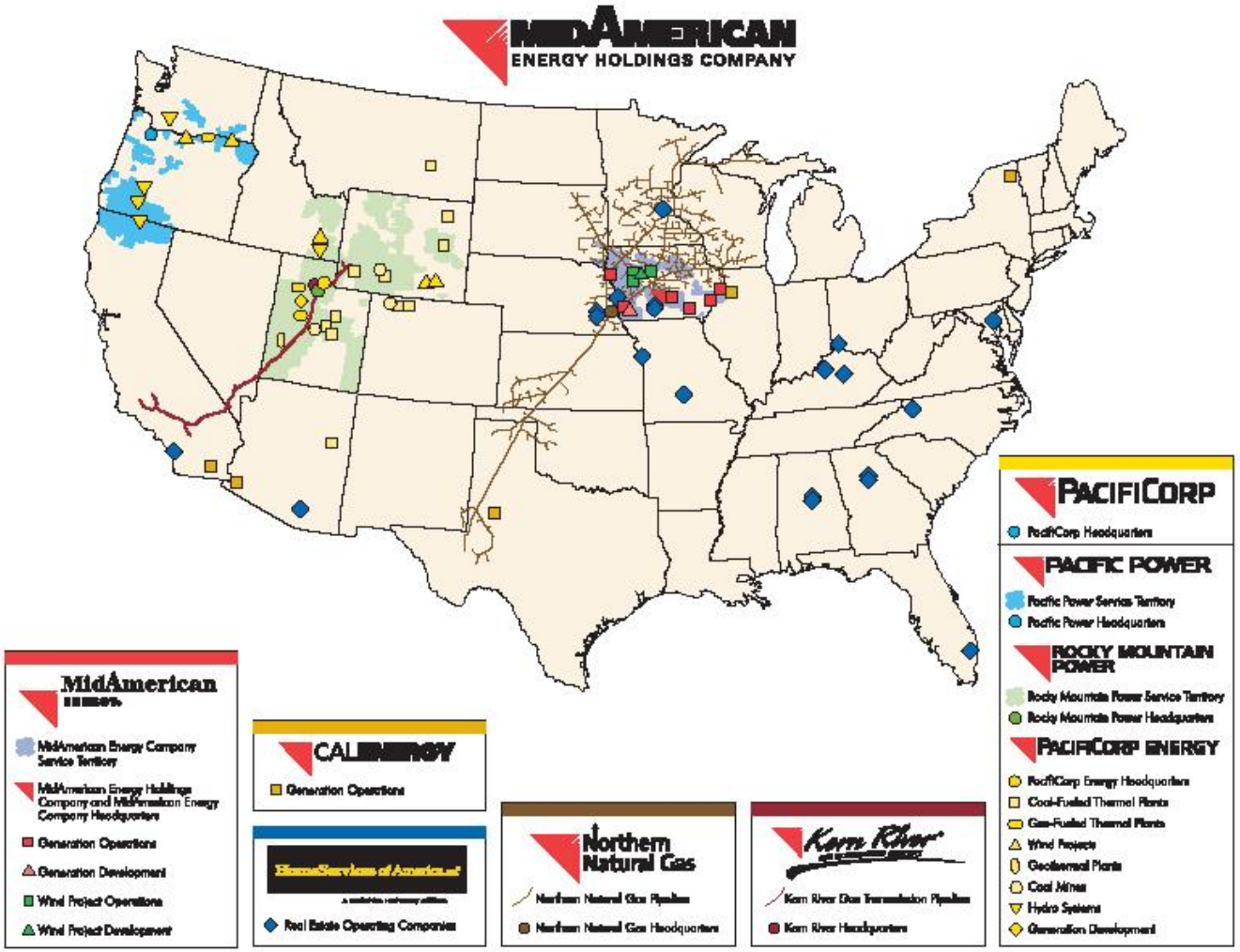
MidAmerican Energy Holdings Company



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PacifiCorp's Renewable Generation Commitments

- The 2007 Integrated Resource Plan (IRP) sets revised renewable targets:

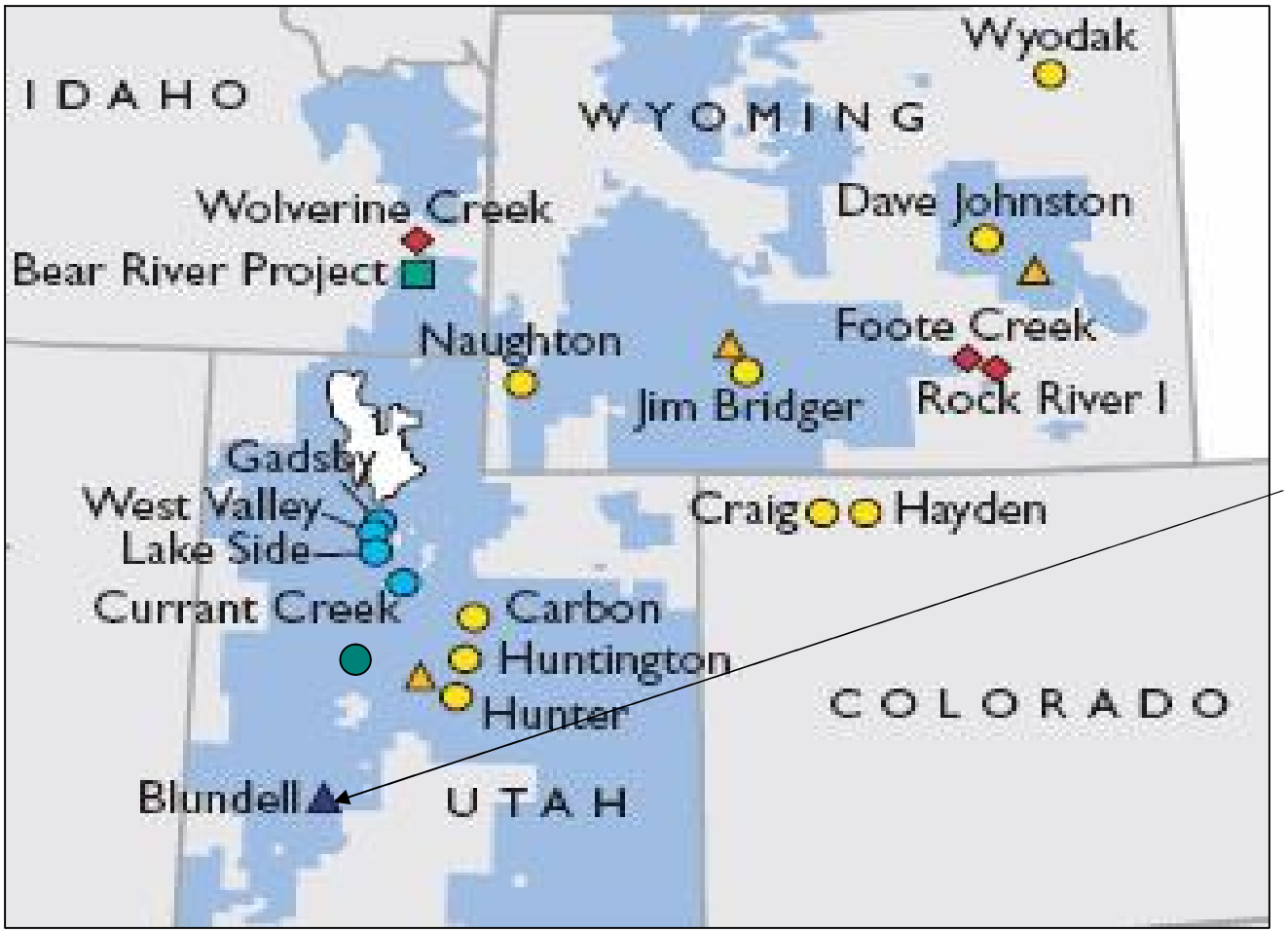
  - **1,400 MW** – The original target date of 2015 has moved to 2010. The commitment remains at 1,400 MW;

  - **2,000 MW** – The 2007 IRP targets 2,000 MW of renewable resources in PacifiCorp's portfolio by 2013. The incremental 600 MW is considered a target.

What Do We Count as Renewable Generation?

- What counts toward the 1,400 MW commitment or the 2,000 MW target?
  - **Much of this will come from wind, but not all.**
- We have defined several resources that "count"
  - Hydro (new and upgrades)
  - Qualifying facility and renewables PPAs
  - Solar, wave & "waste"
  - Geothermal (new and upgrades)

Background on Our Blundell Geothermal Plant



Blundell Geothermal Plant

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Blundell Plant (Looking From North to South)

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Blundell Plant (Looking From West to East)

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Blundell Unit 1 Facts

- Location: Milford, Utah, Beaver County
- Geothermal Resource: Roosevelt Hot Springs
- Generating unit owned and operated by PacifiCorp Energy
- Commercial Date: July 1984
- Net Capability: 23 MW
- Process Design: Single flash
- Steam Conditions: 108 PSIA at 340 degrees F; General Electric steam turbine-generator
- Brine, along with excess condensate, is re-injected
- Very high availability (89 % equivalent availability for 10-year period, 1997-2006)
- Valued as an excellent "base load" renewable resource due to its firm capacity and reliability

Blundell Unit 1 Hurdles After Start-up

- Scaling of turbine-generator with silica and some sodium
  - Lost more than 5 MW of capability in the first 6 weeks
  - Not dry steam
- Silica scaling of injection wells
- We learned each geothermal reservoir is unique
  - There is “limited transfer” of lessons learn from one site to another

Blundell Unit 2 Expansion

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Blundell Unit 2 Expansion Facts

Project – 11 MW bottoming cycle addition

Technology – Ormat Organic Rankine Cycle (ORC); uses iso-pentane

Budget – $28 million (includes interconnection and AFUDC)

Target Commercial operation – November 2007

Constructor – CEntry

Ownership – 100 percent interest

Key factors to watch:

- Silica precipitation at lower injection temperatures and acid injection technology application
- Cold brine injection temperatures for Unit startup
- Equipment – limited experience

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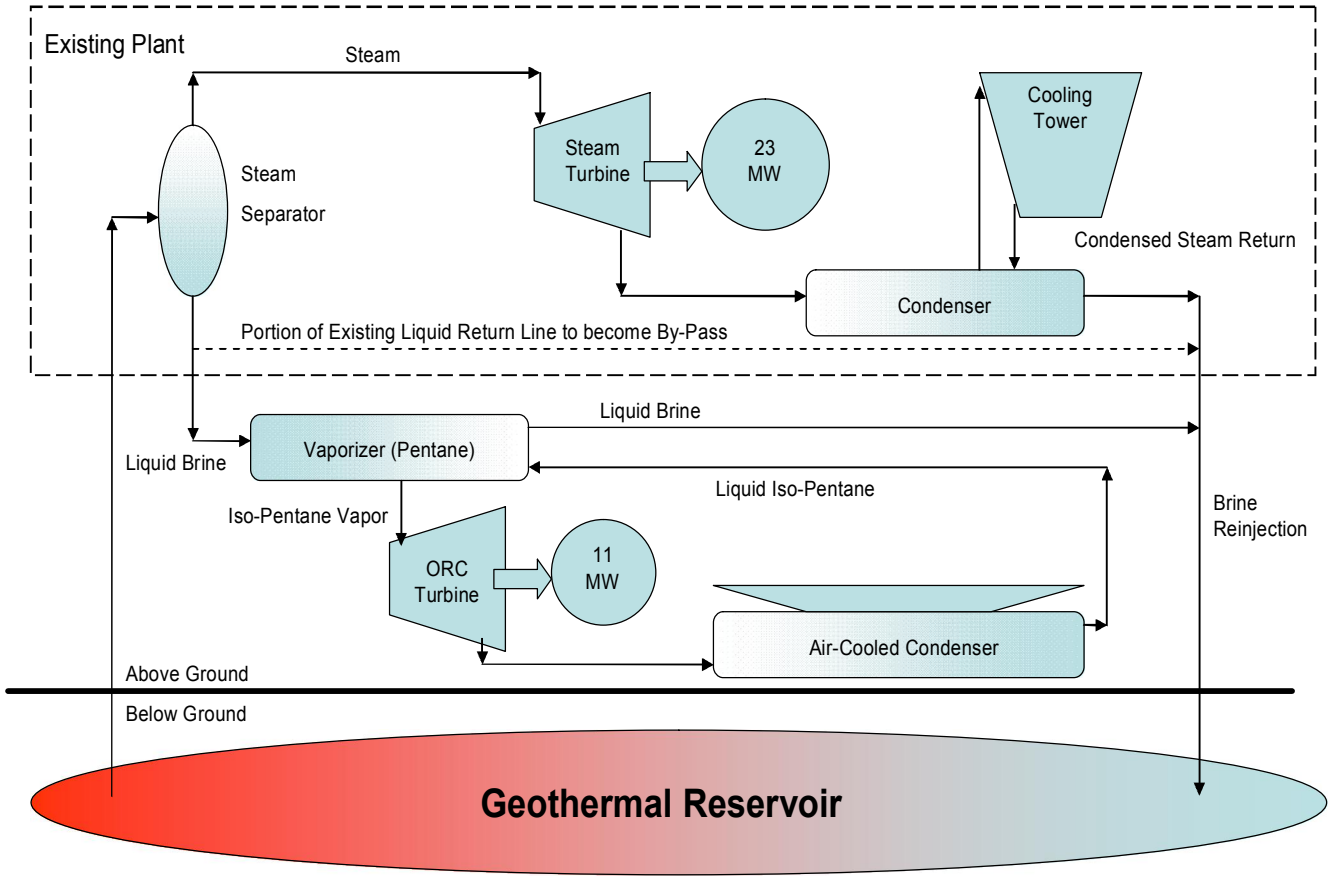
Process Cycle Schematic – After Bottoming Cycle Addition

Blundell Bottoming Cycle Addition



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Blundell Plant During Milford Flat Fire

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General Hurdles for Geothermal Project Development

- Timeline
- Expensive modeling of the production capacity and fluid quality of the geothermal fluid
- Uncertain sustainability of the geothermal resource
- Selection of a process technology
- Well drilling expenses and rig availability
- Well completion risk
- Construction costs
- Project economics
- Application of production tax credits and renewable energy certificates

General Hurdles (Continued)

- Complete estimate of asset life cycle costs including future capital, O&M, and geothermal fluid royalty fees
- Since more "recharge" fluid may be returned to the reservoir than available heat, careful reservoir management must be planned
- Transmission interconnection costs as typical site are not close to loads
- Property and right-of-way acquisition
- Geothermal resource acquisition, typically on federal lands, requiring an extensive approval process
- Water resources
- Limited equipment experience
- "Proving" the geothermal resource is expensive!

Representative Hurdles for a Blundell Unit 3 Expansion Project Development

- Reservoir modeling of the Roosevelt Hot Spring reported that an additional development of about 35 MW was sustainable for 30 years
- Estimated production/confirmation well drilling expenses:
  - 36” diameter hole to a depth of 100’
  - 26” diameter hole to a depth of 500’
  - 17.5” diameter hole to a depth 1700’
  - 12.25’ diameter hole to a depth of 5000’
  - Estimated expense of $4.0 million
- Similarly, injection/confirmation well drilling expenses:
  - Depth of 6000’
  - Estimated expense of $4.5 million

Representative Hurdles (Continued 1)

- Project would require a total well field of four production wells and four injection wells at a cost of $34 million
- In addition to capital costs, life of asset operating expenses include:
  - Fixed and variable O&M; included special maintenance
  - Overhaul expenses
  - BLM royalty fees
  - On-going capital
  - Discrete on-going capital, that is, additional wells in the future to sustain steam flow
  - Transmission interconnection direct assigned facility charge and duration risk

Representative Hurdles (Continued 2)

- Benefit to cost ratio, without application of production tax credits, may not be competitive to other generation resources
- Project schedule, with at-least a 570 day turbine-generator installation interval
- Uncertainty regarding extension of production tax credits application
- Transmission interconnection expenses

Selecting Competing Generation Resources

- Cost of Energy analysis (Capex & O&M)
- Risk analysis around major parameters:
  - Performance (availability, reliability, resource)
  - Capital cost
  - Periodic well maintenance costs and on-going capital
  - O&M and royalties
  - RPS – cost comparison to other renewables options
- Availability and application of incentives:
  - PTC/ITCs
  - Renewables benefits (“carbon, green tags”)
- 3rd Party expert evaluations of geothermal resource

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Geothermal Project Development Options

- Power Purchase Agreement
- Prove geothermal resource and transfer asset
- Joint development (subject to due diligence and appropriate risk sharing)
- Build, Own, Operate, Transfer (BOOT) – covers development, resource and operational risk

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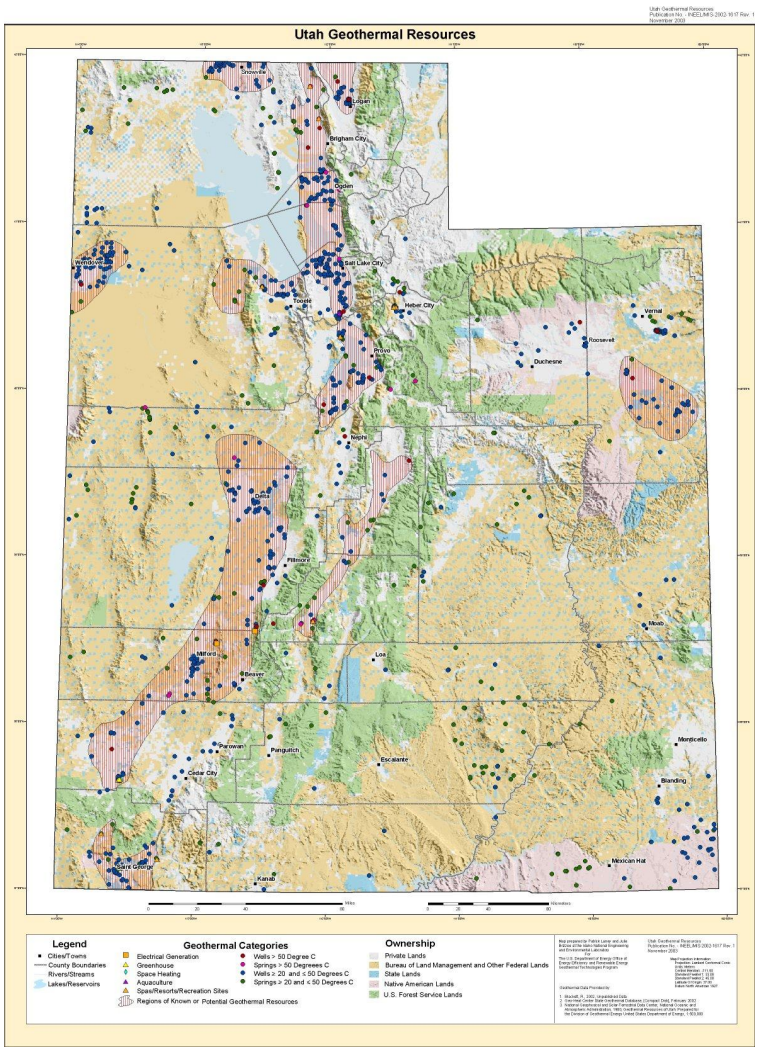
General Feelings

- Geothermal is a nice generating resource
- The Idaho National Laboratory's map on the right illustrates the geothermal energy potential in western Utah



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Thank You

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